IN THE CLAIMS

1 – 3. (Canceled)

4. (Currently Amended) A ~~The~~ memory management apparatus ~~according to claim 2,~~ ~~further comprising~~ for accessing a physical page mapped according to mapping information to a logical page that includes a logical address specified by an access request, the mapping information showing a one-to-one mapping between a plurality of logical pages and a plurality of physical pages, the logical pages being defined by dividing a logical address space by a predetermined size, each of the physical pages functioning to physically retain data of the predetermined size and degrading in storage performance each time an access is made thereto, the apparatus comprising:

an access frequency index storage unit operable to store an access frequency index for each logical page, the access frequency index indicating an occurrence frequency of an access request specifying a logical address included in a corresponding logical page;

a degradation index storage unit operable to store a degradation index for each physical page, the degradation index indicating a degree of degradation in storage performance of a corresponding physical page;

a degradation leveling unit operable to (i) exchange retained data between a first physical page and a second physical page, the first physical page being mapped according to the mapping information to a specific logical page of which the access frequency index is greater than or equal to a first threshold, and the second physical page having the degradation index that is less than or equal to a second threshold, and (ii) update the mapping information so as to show that the specific logical page is mapped to the second physical page;

a cache storage unit operable to store, for each of up to a predetermined number of the physical pages, cache data that is a copy of data retained in a corresponding physical page and that is accessed instead of the original data, and to write, if cache data has been modified as a result of a subsequent access, the modified cache data back to a corresponding physical page;

a degradation index updating unit operable to add a first value to a degradation index of each physical page that retains original data of cache data stored in the cache storage unit, and add a second value to a degradation index of each physical page to which modified cache data has been written back; and

an access frequency index updating unit operable to add the first value to ~~an~~ the access frequency index of a logical page that is mapped according to the mapping information to each physical page retaining original data of cache data stored in the cache storage unit, and to add the second value to ~~an~~ the access frequency index of a logical page that is mapped according to the mapping information to each physical page to which modified cache data has been written back.

5. (Canceled)

6. (Currently Amended) A ~~The~~ memory management apparatus ~~according to claim 2,~~ ~~wherein~~ for accessing a physical page mapped according to mapping information to a logical page that includes a logical address specified by an access request, the mapping information showing a one-to-one mapping between a plurality of logical pages and a plurality of physical pages, the logical pages being defined by dividing a logical address space by a predetermined size, each of the physical pages functioning to physically retain data of the predetermined size and degrading in storage performance each time an access is made thereto, the apparatus comprising:

an access frequency index storage unit operable to store an access frequency index for each logical page, the access frequency index indicating an occurrence frequency of an access request specifying a logical address included in a corresponding logical page;

a degradation index storage unit operable to store a degradation index for each physical page, the degradation index indicating a degree of degradation in storage performance of a corresponding physical page;

a degradation leveling unit operable to (i) exchange retained data between a first physical page and a second physical page, the first physical page being mapped according to the mapping information to a specific logical page of which the access frequency index is greater than or equal to a first threshold, and the second physical page having the degradation index that is less than or equal to a second threshold, and (ii) update the mapping information so as to show that the specific logical page is mapped to the second physical page;

a cache storage unit operable to store, for each of up to a predetermined number of the physical pages, cache data that is a copy of data retained in a corresponding physical page and that is accessed instead of the original data, and to write, if cache data has been modified as a result of a subsequent access, the modified cache data back to a corresponding physical page; and

a degradation index updating unit operable to add a first value to the degradation index of each physical page that retains original data of cache data stored in the cache storage unit, and add a second value to the degradation index of each physical page to which modified cache data has been written back, wherein

the cache data storage unit further stores, at a time of storing cache data, a ~~the~~ cache

access frequency index for the cache data, an initial value of the cache access frequency index

being set to "0",

the memory management apparatus further comprising:

a cache access frequency index updating unit operable to increment a the cache access

frequency index of cache data in response to an access to the cache data; and

an access frequency index updating unit operable to compare, for each piece of cache

data, (i) ~~an~~ the access frequency index of a logical page that is mapped according to the mapping

information to a physical page retaining original data of a corresponding piece of cache data and

(ii) ~~a~~ the cache access frequency index of the corresponding piece of cache data, and to update

the access frequency index with the cache access frequency index if the cache access frequency

index is greater than the access frequency index.

7 – 10. (Canceled)

11. (Currently Amended) The memory management apparatus according to ~~claim 1~~

claim 4, wherein

each physical page is implemented by a ferroelectric random access memory.

12 – 18. (Canceled)

19. (New) The memory management apparatus according to claim 6, wherein

each physical page is implemented by a ferroelectric random access memory.

20. (New) A memory management method for accessing a physical page mapped

according to mapping information to a logical page that includes a logical address specified by

an access request, the mapping information showing a one-to-one mapping between a plurality of

logical pages and a plurality of physical pages, the logical pages being defined by dividing a

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logical address space by a predetermined size, each of the physical pages functioning to physically retain data of the predetermined size and degrading in storage performance each time an access is made thereto, the method comprising:

an access frequency index storing step of storing an access frequency index for each logical page, the access frequency index indicating an occurrence frequency of an access request specifying a logical address included in a corresponding logical page,

a degradation index storage step of storing a degradation index for each physical page, the degradation index indicating a degree of degradation in storage performance of a corresponding physical page;

a degradation leveling step of (i) exchanging retained data between a first physical page and a second physical page, the first physical page being mapped according to the mapping information to a specific logical page of which the access frequency index is greater than or equal to a first threshold, and the second physical page having the degradation index that is less than or equal to a second threshold, and (ii) updating the mapping information so as to show that the specific logical page is mapped to the second physical page;

a cache storage step of storing, for each of up to a predetermined number of the physical pages, cache data that is a copy of data retained in a corresponding physical page and that is accessed instead of the original data, and to write, if cache data has been modified as a result of a subsequent access, the modified cache data back to a corresponding physical page;

a degradation index updating step of adding a first value to the degradation index of each physical page that retains original data of cache data stored in the cache storage unit, and adding a second value to the degradation index of each physical page to which modified cache data has been written back; and

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an access frequency index updating step of adding the first value to the access frequency index of a logical page that is mapped according to the mapping information to each physical page retaining original data of cache data stored in the cache storage unit, and adding the second value to the access frequency index of a logical page that is mapped according to the mapping information to each physical page to which modified cache data has been written back.

21. (New) A memory management method for accessing a physical page mapped according to mapping information to a logical page that includes a logical address specified by an access request, the mapping information showing a one-to-one mapping between a plurality of logical pages and a plurality of physical pages, the logical pages being defined by dividing a logical address space by a predetermined size, each of the physical pages functioning to physically retain data of the predetermined size and degrading in storage performance each time an access is made thereto, the method comprising:

an access frequency index storage step of storing an access frequency index for each logical page, the access frequency index indicating an occurrence frequency of an access request specifying a logical address included in a corresponding logical page;

a degradation index storage step of storing a degradation index for each physical page, the degradation index indicating a degree of degradation in storage performance of a corresponding physical page;

a degradation leveling step of (i) exchanging retained data between a first physical page and a second physical page, the first physical page being mapped according to the mapping information to a specific logical page of which the access frequency index is greater than or equal to a first threshold, and the second physical page having the degradation index that is less

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than or equal to a second threshold, and (ii) updating the mapping information so as to show that the specific logical page is mapped to the second physical page;

a cache storing step of storing, for each of up to a predetermined number of the physical pages, cache data that is a copy of data retained in a corresponding physical page and that is accessed instead of the original data, and writing, if cache data has been modified as a result of a subsequent access, the modified cache data back to a corresponding physical page; and

a degradation index updating step of adding a first value to the degradation index of each physical page that retains original data of cache data stored in the cache storage unit, and adding a second value to the degradation index of each physical page to which modified cache data has been written back, wherein

the cache data storing step further stores, at a time of storing cache data, a cache access frequency index for the cache data, an initial value of the cache access frequency index being set to "0",

the memory management method further comprising:

a cache access frequency index updating step of incrementing a cache access frequency index of cache data in response to an access to the cache data; and

an access frequency index updating step of comparing, for each piece of cache data, (i) an access frequency index of a logical page that is mapped according to the mapping information to a physical page retaining original data of a corresponding piece of cache data and (ii) a cache access frequency index of the corresponding piece of cache data, and updating the access frequency index with the cache access frequency index if the cache access frequency index is greater than the access frequency index.

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